

**AMENDMENTS TO THE DRAWINGS**

Appended hereto as an attachment is a replacement sheet for sheet 2 of the drawings, to replace the corresponding drawing sheet that was originally filed.

Also appended hereto is a marked-up copy of the previously-submitted drawing, showing in red the changes that are included in the replacement sheet. The changes are the addition of a new Figure 5 to show a different pin pair spacing as claimed in claim 15, and to overcome the drawing objection.

No new matter has been added because new Figure 5 merely shows diagrammatically what is disclosed in the specification relative to different pin spacings. Accordingly, approval and entry of the attached replacement formal drawing sheet is respectfully requested.

**REMARKS**

A new Figure 5 of the drawings is presented to overcome the examiner's objection to the drawings. New Figure 5 shows a chain section similar to that of Figure 3 but with different spacings between two successive pin pairs.

Claims 1 through 12 were rejected as obvious based upon a combination of the disclosures of the Friedmann '994 and the Cote et al. '848 references. The Friedmann reference discloses a continuously variable transmission including an endless torque-transmitting means and pairs of conical disks about which the endless torque-transmitting means passes. It also discloses a pivotable guide bar for the endless torque-transmitting means. However, and as specifically admitted by the examiner, that reference does not disclose a sensor for detecting the speed of the endless torque-transmitting means that passes around pairs of spaced conical disks.

The Cote et al. reference was cited for showing a speed sensor 22 associated with a derailleur of a bicycle that is driven by a drive chain. But contrary to the examiner's suggestion, and contrary to the specific language employed in that reference, it does not disclose a sensor for detecting the linear speed of the drive chain. Instead, it discloses a sensor for detecting the angular speed of a jockey wheel, over the outer periphery of which the drive chain comes into contact at a fixed, outer radius. The detected angular speed must then be manipulated to determine a linear speed.

With regard to the Cote et al. reference, it should at first be noted that it does not relate to a continuously variable transmission. There is no showing or

suggestion of the transmission structure as recited in claim 1 in which the axial spacings of respective pairs of conical disks can be inversely changed to change the transmission ratio. Furthermore, the Cote et al. reference relates to a structure for detecting the angular speed of sprocketed jockey wheel 29 that includes circumferentially arranged magnets that are embedded in the jockey wheel at a fixed radial position between the axis of rotation and the outer periphery of the wheel. The single jockey wheel does not have a cooperating wheel that shifts laterally to cause the drive chain to shift its radial position relative to the axis of rotation of the jockey wheel, as in a continuously variable transmission having pairs of conical disks in which one conical disk of a disk pair is movable axially to vary the axial spacing between the disks. The bicycle derailleur disclosed in the Cote et al. reference is thus a completely different structure from the conical disk pairs that are part of a continuously variable transmission. It also operates differently in that it involves an arrangement whereby a drive chain runs at a constant radius around and at the periphery of a sprocketed jockey wheel.

Additionally, the sensor disclosed in the Cote et al. reference is not positioned opposite to and facing the endless torque-transmitting means that is shown as a sprocket chain, and it does not interact with the chain. Instead, the Cote et al. sensor is positioned spaced some radial distance inward of and away from the sprocket chain, and it is arranged opposite to and facing magnets carried by the jockey wheel. The sensor is not opposite to and facing the endless torque-transmitting means, as claimed in claim 1.

Summarizing, in addition to not having any relationship at all with a continuously variable transmission having axially displaceable disks, the Cote et al. reference does not disclose or suggest the following limitations contained in claim 1:

1. a sensor positioned opposite to and facing an endless torque-transmitting means;
2. a sensor positioned for sensing the linear speed of an endless torque-transmitting means as it passes the sensor;
3. a sensor located at a position relative to the endless torque-transmitting means that is independent of the rotational speed relationship of conical pulley pairs.

Thus, the Cote et al. reference does not disclose or even suggest a structural arrangement such as that claimed in amended claim 1.

In addition to the fact that neither of the references relied upon by the examiner individually shows or suggests the claimed arrangement, even if they were to be combined, the combination does not show or suggest the claimed arrangement. As noted above, neither of the references discloses or suggests a sensor positioned opposite to and facing an endless torque-transmitting means for detecting the linear speed of the endless torque-transmitting means as it passes the sensor. And because both references lack a disclosure of that arrangement, the combination cannot be said to teach or suggest such an arrangement.

Furthermore, the references relied upon each relate to vastly different structures, one involving an automotive-type continuously variable transmission and the other involving a bicycle drive system. And in addition to the structures disclosed in the references being different, the way they function is also different. It is suggested that one faced with a problem in the continuously variable transmission art involving pairs of axially displaceable conical disks would not be led to the unitary sprocket wheel drive arrangement typical of the bicycle drive system art for a solution to that problem – in each instance the structures involved and the way in which they operate are completely different. And, very significantly, because of the vastly different structures and different operating modes for the arrangements disclosed in the two references, there would be no motivation for one to combine them. Moreover, the references themselves contain no disclosures that would motivate one to even attempt their combination, and the examiner has not cited any such motivating disclosure in either of the references. Only by some hindsight guidance gleaned from knowledge of what is contained in the present disclosure would one even consider the disparate references that were relied upon. But it is an improper basis for rejection to use as a road map or as a template an inventor's disclosure to aid in picking and choosing particular parts of particular references that allegedly can be combined to render obvious that which only the inventor has taught.

Although one could in hindsight assert, as the examiner has done, that there exists a motivation to make a combination of particular references in a

particular way, such a hindsight assertion is insufficient. In that regard, for there to be a sufficient showing of a motivation to combine the teachings of references, that motivation must be supported by referring to some relevant and identifiable source of information that would provide the necessary motivation. The mere existence of particular elements in different references is not sufficient. And conclusory statements of possible advantages that might, in hindsight, lead one to combine the teachings of several references, and assumptions of what an ordinarily skilled person would or would not do, are by themselves inadequate to support a conclusion that there exists a motivation to combine references in a particular way. Consequently, the mere assertion of a subjective possible convenience that might be achieved by combining the teachings of different references is insufficient to support a conclusion of motivation to combine and of obviousness of a claimed combination.

In connection with combining the references as suggested by the examiner, one having only ordinary skill in the art would use the Cote et al. sensing arrangement and apply it to the Friedmann structure. Thus, the Friedmann conical disks would include circumferentially-distributed magnets that are positioned radially inwardly of the conical disk periphery to detect disk angular speed. That speed could then be converted into a linear speed by multiplying the angular speed by the radius at which the magnets are positioned. The result would be the linear speed of the endless torque-transmitting means at the particular magnet radius, which is a fixed radius as taught by the structure disclosed in the Cote et al. reference.

In a continuously variable transmission, on the other hand, the radial position of the endless torque-transmitting means varies, depending upon the axial spacing between the conical disks, which is influenced by the load demand imposed upon the transmission. Consequently, the Cote et al. arrangement, at best, could enable a determination of the endless torque-transmitting means linear speed at only one operating condition – that condition wherein the endless torque-transmitting means was located at the same radial position as that of the magnets embedded in the conical disk. When the endless torque-transmitting means is at a different radial position from that of the magnets, the determined linear speed would not be the linear speed of the endless torque-transmitting means. Thus, applying the Cote et al. structural arrangement to the Friedmann transmission structure would require some undisclosed way of determining the radial position of the endless torque-transmitting means before an accurate linear speed of the endless torque-transmitting means could be determined. Therefore the combination of those references would not provide the desired result. And the present invention does not require a determination of the radial position of the endless torque-transmitting means relative to the conical disk axis of rotation.

In assessing the approach that would be taken by a person having only ordinary skill in the art, the Court of Appeals for the Federal Circuit has characterized such a person and his approach as follows:

The issue of obviousness is determined entirely with reference to a hypothetical "person having ordinary skill in the art." It is only that hypothetical person who is presumed to be aware of all the pertinent prior art. The actual inventor's skill is irrelevant to the inquiry, and this is for a very important reason. The statutory emphasis is on a person of ordinary skill. Inventors, as a class,

according to the concepts underlying the Constitution and the statutes that have created the patent system, possess something -- call it what you will -- which sets them apart from the workers of ordinary skill, and one should not go about determining obviousness under § 103 by inquiring into what patentees (i.e., inventors) would have known or would likely have done, faced with the revelations of references. *A person of ordinary skill in the art is also presumed to be one who thinks along the line of conventional wisdom in the art and is not one who undertakes to innovate, whether by patient, and often expensive, systematic research or by extraordinary insights, it makes no difference which.* See the last sentence of § 103, *supra*.

*Standard Oil Co. v. American Cyanamid Co.*, 227 U.S.P.Q. 293, 297-98 (Fed. Cir. 1985) (emphasis added).

The person of only ordinary skill in the art would, at best, do as is suggested above – to merely substitute the Cote et al. arrangement into a Friedmann-type transmission, which, with some calculation, could provide an endless torque-transmitting means linear speed. But that linear speed would be an accurate endless torque-transmitting means linear speed at only one radial position of the endless torque-transmitting means – when it is at the same radius as that of the magnets carried by the conical disk.

And in assessing at what point in time the obviousness determination is to be made,

To reach a proper determination under 35 U.S.C. 103, the examiner must step backward in time and into the shoes worn by the hypothetical “person of ordinary skill in the art” when the invention was unknown and just before it was made. In view of all factual information, the examiner must then make a determination whether the claimed invention “as a whole” would have been obvious at that time to that person. Knowledge of applicant's disclosure must be put aside in reaching this determination, yet kept in mind in order to determine the “differences,” conduct the search and evaluate the “subject matter as a whole” of the invention. The tendency to resort to “hindsight” based upon applicant's disclosure is often difficult to avoid due to the very



nature of the examination process. However, *impermissible hindsight must be avoided and the legal conclusion must be reached on the basis of the facts gleaned from the prior art.* M.P.E.P. § 2142 (emphasis added)

In this case, the facts gleaned from the prior art references do not teach or suggest the claimed invention.

As to how the claims at issue must be considered in the light of the prior art,

To establish *prima facie* obviousness of a claimed invention, *all the claim limitations must be taught or suggested by the prior art.* *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). M.P.E.P. § 2143.03 (emphasis added).

In this case, all the claim limitations of claim 1 are not taught or suggested by the prior art references relied upon.

And in connection with evaluating references relative to a claimed invention,

[T]he deficiencies of the cited references cannot be remedied by the Board's general conclusions about what is "basic knowledge" or "common sense" to one of ordinary skill in the art....We cannot accept these findings by the Board. This assessment of basic knowledge and common sense was not based on any evidence in the record and, therefore lacks substantial evidence support....With respect to core factual findings in a determination of patentability, however, the Board cannot simply reach conclusions based on its own understanding or experience -- or on its assessment of what would be basic knowledge or common sense. Rather, the Board must point to some concrete evidence in the record in support of these findings. *In re Zurko*, 59 U.S.P.Q.2d 1693, 1697 (Fed. Cir. 2001).

In the present instance there is no concrete evidence in the record that would support the obviousness conclusion.

The invention as claimed in claim 1 is directed to an invention that is not obvious from the teachings of the references relied upon. Claims 2 through 12 each depend from claim 1, either directly or indirectly, and therefore the same distinctions as are noted above in connection with claim 1 apply with equal effect to each of those dependent claims. Moreover, the dependent claims contain additional recitations that further distinguish the invention as so claimed from the teachings of the references that were relied upon. For example, claim 4 recites the further limitation that the endless torque-transmitting means is a plate-link chain and includes pins, and it is those pins that are detected by the sensor as the pins pass the sensor. The Cote et al. reference does not teach or suggest sensing chain pins as they pass a sensor, only magnets fixed in position in a jockey wheel and radially spaced from the chain.

Claims 13 and 14 were rejected as obvious based upon the combination of the Friedmann '994 and the Affeldt et al. '236 references. In that regard, claim 13 has been amended to more clearly differentiate the invention as claimed from the disclosures contained in those references. Relative to those claims, the examiner acknowledged that although the Friedmann reference discloses a continuously variable transmission having a guide bar for guiding the movement of an endless torque-transmitting means as it passes between pairs of pulleys, it does not disclose a sensor for detecting pins and for determining the linear speed of the endless torque-transmitting means. The Affeldt et al. reference was

cited and relied upon as showing a sensor positioned opposite pins carried by a chain for determining chain speed. However, that secondary reference, which discloses a fruit conveyor, is drawn from a non-analogous art that has no relation to power transmission drive chains. Moreover, it does not teach or suggest a guide bar including a passageway section that surrounds and encloses the chain and defines a chain-receiving opening through which the chain passes. Instead, it teaches an open, U-shaped track 16 (see Affeldt et al., col. 3, line 57, and Fig. 4) and, additionally, it teaches a chain having pins that extend out from the track (see Affeldt et al., col. 4, line 2), and not a section that surrounds and encloses the chain, and it does not disclose spaced pairs of parallel pins. More significantly, that reference does not show a sensor carried at an enclosing passageway section and that extends into a chain-receiving opening, as claimed in amended claim 13. Accordingly, claim 13 recites a structure that is not shown in or even suggested by either of the Friedmann or the Affeldt et al. references.

Claim 14 depends from claim 13 and is similarly distinguishable over the relied-upon references.

Claims 15 and 16 were rejected as obvious based upon the Friedmann, the Affeldt et al., and the Cole, Jr. '701 references. Because claims 15 and 16 each depend from claim 13, either directly or indirectly, those claims are distinguishable over the Friedmann and Affeldt et al. references for the same reasons as are given above in connection with claim 13. The Cole, Jr. reference was cited for showing a chain having different pin spacings. However, claim 15 as amended refers to the different spacing between pin pairs, and that reference

shows pin pairs that are equally spaced. In that regard, the Cole, Jr. reference point out that the links have a substantially constant pitch, and if the link pitches are the same the pin spacings would, of necessity be equal, not different as recited in claims 15 and 16. Thus, those claims are distinguishable over each of the three references relied upon.

Based upon the foregoing amendments and remarks, the claims as they now stand in the application are believed clearly to be in allowable form in that they patentably distinguish over the disclosures contained in the references that were cited and relied upon by the examiner, whether those references be considered in the context of 35 U.S.C. § 102 or of 35 U.S.C. § 103. Reconsideration and reexamination of the application is respectfully requested with a view toward the early issuance of a Notice of Allowance.

The examiner is cordially invited to telephone the undersigned attorney if this amendment raises any questions, so that any such question can be quickly resolved in order that the present application can proceed toward allowance.

Respectfully submitted,



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